

## ARGENTIUM 935 MILLFORM SILVER

### FOR SHEET, WIRE, TUBING

A patented, superior silver with excellent physical and working properties. It is firestain free, hypoallergenic and tarnish resistant with a bright-white colour. Manufacturers and silversmiths are offered additional options of fusing, welding and increasing the hardness of finished pieces by a simple, low-temperature heat treatment.

#### CONTENT

93.5% silver, copper and germanium.

#### MELTING RANGE

803-903°C / 1477-1657°F

#### RELATIVE DENSITY

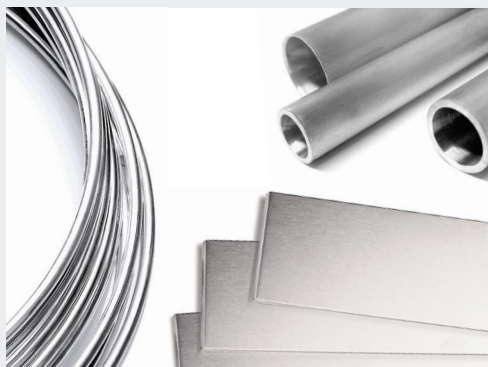
10.3g/cm<sup>3</sup>

#### ANNEALED HARDNESS

64-74HV (depending upon quenching or air-cooling after annealing).

#### REDUCTION

Maximum of 50% reduction between each annealing.



### ANNEALING / COLOUR DIFFERENCE AT RED HEAT

**IMPORTANT:** ARGENTIUM SILVER GLOWS A PALER COLOUR THAN TRADITIONAL STERLING AT RED-HOT TEMPERATURES.



When torch annealing, allow Argentium 935 Millform Silver to reach a pale glow (620°C / 1148°F) rather than the brighter red glow associated with annealing traditional sterling silver.

*Tip: Temperature/metal colour recognition is easier to judge working in a shaded area.*

### FURNACE ANNEALING

#### Temperature

580-650°C / 1076-1202°F (dependent on the thickness of the material being annealed) for 20-40 minutes.

#### Controlled furnace atmosphere

Ratio of 95:5 or 90:10 nitrogen:hydrogen or either just nitrogen or argon (low hydrogen is necessary to optimise tarnish resistance).

### TOUCHING / QUENCHING AFTER ANNEALING

**IMPORTANT:** ARGENTIUM RETAINS HEAT FOR LONGER THAN TRADITIONAL STERLING SILVER - TOUCHING OR QUENCHING TOO QUICKLY WILL CAUSE CRACKING.



*Tip: Allow Argentium 935 Millform Silver to cool until the red glow has completely disappeared (below 530°C / 986°F) before touching or quenching.*

**PICKLING**
**Recommended**

10% Sulphuric Acid solution or Sodium Bisulphate, weak Sparex, Phosphoric Acid (diluted as per supplier's instructions). Keep pickling time to a minimum.

**Not recommended**

Hydrofluoric Acid - this will dissolve the protective germanium oxide layer.

**POLISHING**

Finished items can be polished by traditional methods...

- Mops, wheels and polishing compounds.
- Barrel polishing with a range of abrasive media.

**Tip: The use of separate polishing media and mops for Argentium Silver items is recommended - this prevents cross-contamination of another metal/alloy onto the surface of Argentium pieces, which can diminish tarnish resistance.**

**HEAT HARDENING**

Argentium Silver has the unique ability to be hardened by a simple, low-temperature heat treatment - suitable for even soldered items.

**When to heat-harden items**

Before final polishing and finishing.

**Method**

Place articles in a clean oven set to 300°C / 572°F for a minimum of 1.5 hours then...

- a) remove items from the oven and allow to cool in air *or*
- b) for a slightly greater hardness, switch off oven and allow items to slowly cool to room temperature inside the enclosed oven.

**CLEANING AND RINSING**

To allow Argentium Silver to produce its protective germanium oxide and maximise tarnish resistance, a clean, grease-free surface is required. It is important that residues from polishing compounds are thoroughly removed from the surface, as these can cause discolouration.

A measure of cleanliness is to observe when items are rinsed with water, the surface should be free of water breaks.

**Tip: Electrolytic cleaning is recommended as a final cleaning step, to ensure a grease-free surface.**

**ULTRASONIC CLEANING**
**Cleaning solution**

A neutral (pH 7 - 9) aqueous soap solution made with distilled water.

**Temperature / Time**

50°C / 122°F for 2 minutes

After degreasing, rinse items with preferably distilled water at room temperature and dry (if using hot air, this should be below 70°C / 158°F).

**Tip: Use of distilled water for cleaning/rinsing is recommended to prevent water marks. Please do NOT use deionised/reverse osmosis water, as this can damage Argentium's protective germanium oxide and reduce tarnish resistance.**

**ELECTROLYTIC CLEANING**
**Cleaning solution**

Commercially available alkaline cleaner (preferably containing an inhibitor).

**Temperature / Time**

Follow manufacturer's instructions.